

Rediscovery and Distribution of
Bembidion plagiatum Zimmermann (Coleoptera: Carabidae)

RICHARD L. HOFFMAN

Department of Biology,
Radford University, Radford, Virginia 24142

ABSTRACT.— *Bembidion plagiatum* Zimmermann, heretofore considered one of the scarcest American members of the genus, is reported from new localities in New Jersey, Pennsylvania, Virginia, and North Carolina. At the two known Virginia localities the species seems to prefer silt-coated sandbars up to several meters distant from the stream side, a habitat not shared with other bembidiids. Collection dates suggest that the species is active from April to early July; adults have not been found after that time. Both external details and structure of the penis suggest that *plagiatum* is closely related to *B. lacunarium* rather than the species with which Lindroth (1963) associated it on the basis of color pattern.

At the time Prof. C. H. Lindroth revised the bembidiid fauna of boreal North America (1963) and re-established *Bembidion plagiatum* as a valid species, he had seen only two specimens: the original type from "Maryland" and a female that he collected at Long Point, Ontario. Other specimens must have been found in between these two, however, to judge from Hayward's remark (1897:82) that "Specimens with a submarginal pale spot (*plagiatum* Zimm.) bear some resemblance to *scopulinum* ..."; nonetheless Lindroth quite justifiably stated that *plagiatum* was "Apparently strictly eastern and very rare."

Despite a renaissance of interest in American bembidiids in recent years, I am not aware of any subsequent discoveries of *plagiatum*. Having had the good fortune to recently find this species in Virginia (as well as in museum collections and other people's notes), I feel that some remarks on its apparent favored biotope and the enumeration of new localities will be of interest to carabidologists.

The first specimen that came to my attention entered through the back door, so to say, as the result of my curiosity about the Southern Pines, North Carolina, record for *B. scopulinum*: Kiröy cited in Brimley's *Insects of North Carolina* (1938:117). That this northern species would occur naturally at Southern Pines seemed utterly implausible so I obtained on loan all of Brimley's *Bembidion* material for a personal examination. Although the tray labeled *scopulinum* does contain a specimen of that species from New Hampshire, the single female from

Southern Pines (A. H. Manee, leg.) lacks the coarse temporal punctation of *scopulinum* and keys out readily to *plagiatum* in Lindroth's synopsis.

In June, 1969, Dr. Thomas C. Barr, Jr. collected a single male of *plagiatum* on Blackrock Creek in Horse Cove, Transylvania County, North Carolina, and this record in connection with those for Southern Pines and "Maryland" rendered the eventual discovery of *plagiatum* in Virginia almost certain.

The first known Virginia specimen was a female obtained amongst a variety of common bembidiids along Cobb's Branch, a tributary to Smith River (about 2 km northwest of Irisburg on Virginia Highway 750), Henry County, Virginia, on July 14, 1980. These beetles were not identified until a week later, so that the immediate return visit to the site occurred only near the end of July. It did not produce any further specimens of *plagiatum*, nor did subsequent spot-checks made even later in the summer. However, sampling on April 18, 1981, yielded an adult male, and two females were found on May 2, 1981. The yellow elytral spots were conspicuous enough that the species could be recognized in the field without magnification, and it was possible to associate individuals with their precise biotope. On May 28, 1981, another male was found along the Sandy River (upstream of its crossing by Virginia Highway 855), Pittsylvania County, about 14 km northeast of the Cobb's Branch locality. Sampling at both these localities later in the summer of 1981 produced no additional specimens.

Two additional new localities came to my attention serendipitously. In reporting my Virginia finds to Dr. Terry Erwin, he recalled having located a specimen in the California Academy of Sciences collected at Phillipsburg, New Jersey, June 25, 1915, by J. W. Green. While examining the type specimen of *plagiatum* at Harvard on my behalf, Dr. A. F. Newton, Jr. located an individual—overlooked by Lindroth—in the Horn Collection labeled only "Allegheny, Pa." and identified as this species in Horn's handwriting. The original hamlet of Allegheny no longer occurs on most maps, the place having long since been consumed in the urban spread of Pittsburgh.

At the two Virginia localities, *plagiatum* was found only on gravel-sand bars with a surface coating of fine damp silt, about 0.5 to 1 m above water level and 2 or 3 m removed from the edge. The only associated member of the genus here was *B. inaequale* but the biotope was shared by the tachyine *Elaphropus vivax* (LeConte) and the staphylinids *Geodromicus brunneus* Say, *Homaeotarsus bicolor* (Gravenhorst), *Philonthus* sp., *Scopaeus* sp., and *Lissobiops serpentinum* (LeConte). Along

the water's edge *B. nigrum* (Cobb's Branch) and *B. honestum* (Sandy River) were extremely abundant. The sandbars were at the time devoid of vegetation and were exposed to full sun at one place and afternoon insolation at the other. Both streams were about 2 to 3 m wide and entrenched in sandy floodplain at both sites.

Dr. Barr informed me (in litt.) that his specimen from Horse Cove was likewise found on a sandbar, near the mouth of Blackrock Creek, and that repeated visits during the summer of 1969 failed to produce another. This observation parallels my own lack of success at Cobb's Branch after mid-July. Perhaps the species is active as an adult only during spring and early summer, at least in the south. Manee's capture at Southern Pines, North Carolina, was made in April. Lindroth's Ontario specimen was found June 7, 1956. By late July the sandbars at the two Virginia sites were considerably grown up in rank weedy vegetation that considerably altered the former appearance and doubtless also affected the microhabitat conditions as well.

Examination of my material revealed an interesting structural feature perhaps diagnostic of this species. As shown by Figure 1 the 1st elytral interval (sutural) is provided with one or two adventitious setae near the apical end, in all four specimens. Dr. Newton kindly examined the male holotype at Harvard and reported one such seta on each side,

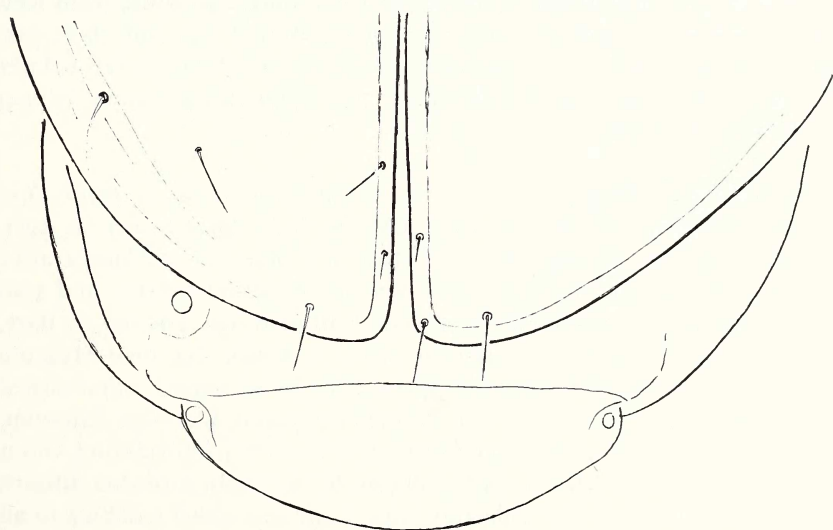


Fig. 1. Posterior end of abdomen of specimen of *Bembidion plagiatum* (Henry County, Virginia) showing accessory setae on 1st elytral intervals apparently characteristic of this species.

slightly posterior to the positions shown in my drawing.

In most other respects, this species is extremely similar in body form and minute details of structure to *B. lacunarium*, which was also named by Zimmermann at the same time as *plagiatum*. Aside from the setae just noted, the obvious external difference evident to me is the apical yellow elytral spot, which appears to be the result of local translucence of the integument that allows the folded wing tips to show through, and not the reflection of yellow pigment per se.

Contrary to Lindroth's remark that "It is difficult to understand how this species could be regarded as a synonym (spotted form) of *lacunarium* . . .", I can see every justification for postulating a close relationship. Lindroth placed *plagiatum* in his *striola* group, so far as I can perceive, solely on the basis of elytral spots, against the more solid evidence of both body form and penial structure. His own drawings (Figs. 155f, 159f) show that the internal armature of the penis sac allies *plagiatum* with *lacunarium* at the same time it shows these two species to be disjunct in the groups to which he assigned them. Perhaps both, along with *B. texanum*, merit recognition in a separate species group.

Several seasons of fairly intensive field work in southwestern Virginia have failed to disclose *plagiatum* in the mountains, where it seems to be replaced by *lacunarium*. The collective localities now known suggest a wide distribution at low to moderate elevations, extending from New Jersey south to North Carolina, east of the Blue Ridge, and then, presumably, northward on the west side of the Appalachians as far as Lake Ontario. The map (Fig. 2) graphically represents this apparent "Upper Austral" distribution.

ACKNOWLEDGMENTS.— C. S. Brimley's material of *Bembidion* was kindly loaned by Mr. James E. Greene, N. C. Department of Agriculture, Raleigh; Dr. Alfred F. Newton, Jr., Museum of Comparative Zoology, examined the type specimen of *plagiatum* for me and also identified the staphylinids taken at Cobb's Branch; Dr. Thomas C. Barr, Jr., University of Kentucky, and Dr. Terry L. Erwin, National Museum of Natural History, generously permitted me to report unpublished information from their files. Mr. Robert Davidson, Carnegie Museum, read an early draft of the manuscript and provided information about the location of "Allegheny, Pa.". Roberta R. Hoffman provided diligent and skillful assistance on collecting trips. I am very much indebted to all of these persons for their contributions to the knowledge of an interesting and generally overlooked ground beetle.

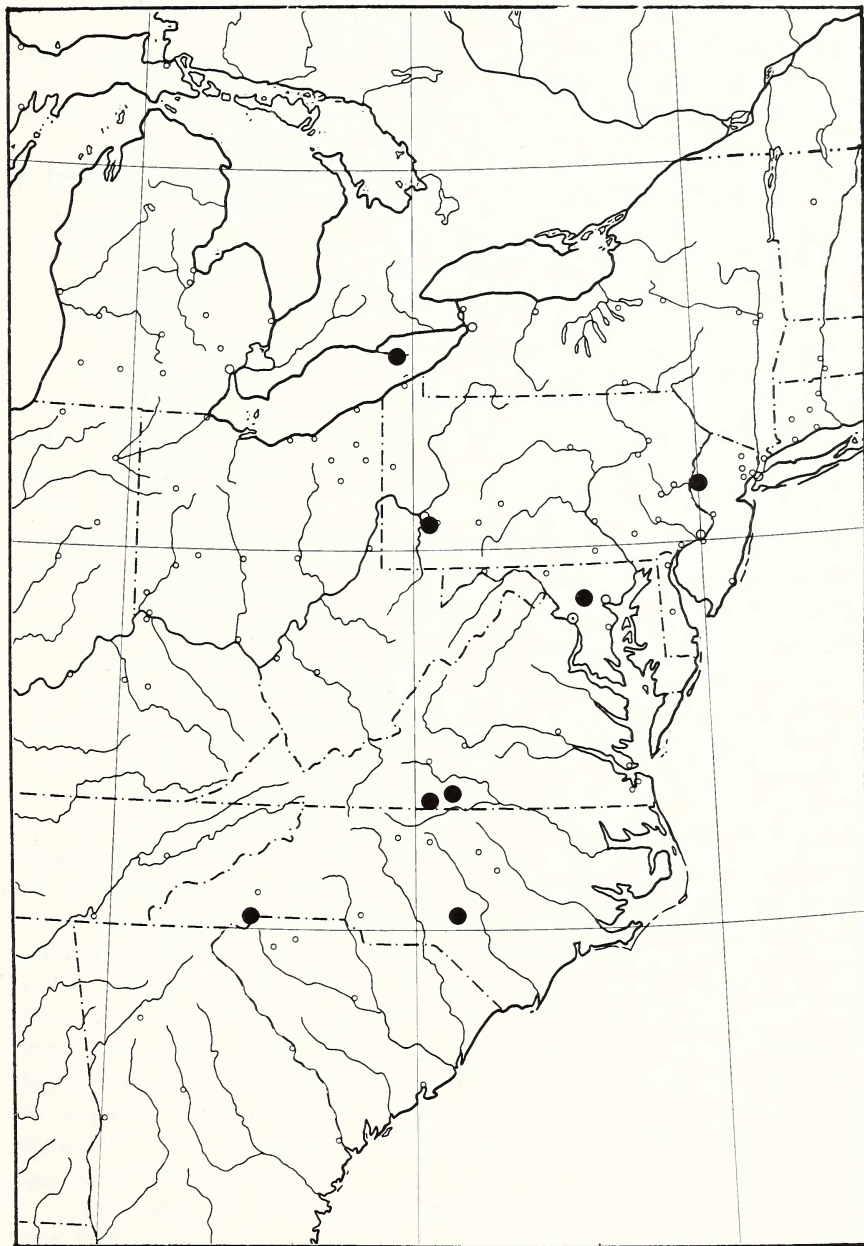


Fig. 2. Known localities for *Bembidion plagiatum* in eastern North America. The spot for Maryland is arbitrarily centered in the state as the specimen it represents lacks precise data.

LITERATURE CITED

- Brimley, C. S. 1938. The Insects of North Carolina. N. C. Dep. Agric. Div. Entomol., Raleigh. 560 pp.
- Hayward, Roland. 1897. On the species of *Bembidium* of America north of Mexico. Trans. Am. Entomol. Soc. (Phila.) 24:32-158
- Lindroth, Carl H. 1963. The ground-beetles (Carabidae, excl. Cicindelinae) of Canada and Alaska. Opusc. Entomol. Suppl. 24:201-408.

Accepted 16 October 1981